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NAVY CLOTHING AND TEXTILE RESEARCH FACILITY NATICK MASS F/G 15/5
ONE-SIZE SLUSH-MOLDED POLYVINYL CHLORIDE COVER FOR THE NAVY MAL--ETC(U)
AUG 77 A J CHAIKEN
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| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Navy Clothing & Textile Research Facility (NCTRF) has completed the service evaluation of the one-size, elastomeric, slush-molded white plastic cover for the male's standard Navy service combination cap. Field response has indicated that the one size is inadequate and that the item is generally too heavy for normal everyday usage. A survey of the slush molders has revealed no firm interest in producing a molded, flexible, soft cap cover. (U) | | |

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ONE-SIZE SLUSH-MOLDED POLYVINYL CHLORIDE COVER FOR THE
NAVY MALE SERVICE COMBINATION CAP
FRAME
(FINAL REPORT)

INTRODUCTION

The Navy Clothing and Textile Research Facility (NCTRF) has developed a slush-molded, one-size, elastomeric plastic white cap cover to fit the standard U.S. Navy male service combination cap frame. Its investigation was initiated as an in-house study to develop suitable substitute materials for the standard 100 percent cotton cover for men's caps.

Plastic white covers were considered as a suitable replacement because they readily resisted soiling, were waterproof (rainproof), and still provided an attractive military appearance to the wearer. If the plastic cover became discolored or soiled, it could be readily and adequately cleaned and still be worn on the service combination cap frame. The cotton cover, however, had to be removed from the cap frame. The plastic surfaces in most cases would be cleaned with a cleaning cloth dampened in water. The use of a plastic material for cap covers, whether fabricated by a cut, sewn and stitching process or molded of one piece, would save monies in logistics, maintenance and purchase.

NCTRF has decided to terminate this program, however, because (a) the final field tests were unfavorable in several categories and (b) no slush-molding manufacturers wanted to make this item.

This report discusses the results of the field tests and of the survey of slush-molding manufacturers.

DISCUSSION

In-house experimentation of a size 7 slush-molded cover revealed its potential to fit adequately the 13 standard sizes for the male service combination cap frame. Field trials in which the one-size, slush-molded cover was distributed to 60 subjects (with 44 responses) indicated that two sizes -- small and regular -- could accommodate the entire Navy head-size range (1). Small would fit head sizes 6 1/2 to 7 1/8 and regular would comprise sizes 7 1/4 to 8. (Navy head sizes are measured in increments of one-eighth inch for ease of fit.) Information obtained from the Navy's standard distribution lists indicated that 65 percent of the Navy men wear service combination cap frames in sizes 7, 7 1/8 and 7 1/4.

A final questionnaire was distributed to the 44 subjects who responded to the previous field test. Twenty subjects responded, of which 65 percent were enlisted and 35 percent commissioned officers. Their average length of Naval service was 17 years. Response data from the service test are listed in Appendix A.

Although at the inception of the test many of the participants liked the concept of a one-size molded cap cover, after several months' wear, many individuals found the item hot, heavy and generally uncomfortable. The overall weight of the experimental item was about 40 percent heavier than the current plastic fabricated cover. Test participants who had head sizes of 6 5/8 and smaller did not continue in the evaluation because the molded cover was too large, clumsy, and ill-fitting for satisfactory military appearance.

The findings initially reported in reference (1) as to design, attractiveness, color, luster, texture, etc., did not significantly change in the final survey. Although a portion of the experimental covers were equipped with ventilation holes, inserted in the rear of the lower flare portion of the cover, approximately one-half of the test participants felt that the ventilation was inadequate.

Test participants indicated that the experimental item was worn primarily at shore activities. Fifty-five percent of the subjects indicated that the cover and cap frame were worn for less than 1 hour and 40 percent that they were worn generally on an average of 3 hours per day. No test subject indicated that the experimental item was worn for over 8 hours.

Concurrent with the service evaluation, NCTRF conducted a market survey to discover manufacturing facilities equipped to produce experimental or production quantities of this slush-molded cover. The concern that produced the initial mock-up slush-molded cover design indicated that it could neither continue the development project nor furnish additional sources of manufacture. As a result of our industry-wide market survey of slush molders, no concern indicated an interest in pursuing this matter.

CONCLUSION

Because our market research failed to locate manufacturers interested in producing this item and the final test data collected from the fleet personnel were disappointing, we recommended that the study be terminated.

Appendix A. Test Results (20 Participants)

1. Did you notice any visual (physical) change in the experimental item during usage in regard to the following attributes:

| | <u>Yes</u> | <u>No</u> |
|----------------------------|------------|-----------|
| Appearance | 30.0% | 70.0% |
| Design (Shape) | 10.0% | 90.0% |
| Loss of color (whiteness) | 15.0% | 85.0% |
| Loss of color (glossiness) | 15.0% | 85.0% |
| Fit | 5.0% | 95.0% |

2. Did you ever find the experimental cover uncomfortable in regards to the following temperatures:

| | <u>Yes</u> | <u>No</u> | <u>No Comments</u> |
|-------------|------------|-----------|--------------------|
| Above 68° F | 60.0% | 35.0% | 5.0% |
| Below 68° F | 15.0% | 50.0% | 35.0% |

2A. Was the experimental item worn in a cold environment, such as temperatures of 50° F and below?

| | <u>Yes</u> | <u>No</u> |
|--|------------|-----------|
| | 65.0% | 35.0% |

2B. Was the experimental item worn in the tropics?

| | <u>Yes</u> | <u>No</u> | <u>Don't Know</u> |
|--|------------|-----------|-------------------|
| | 30.0% | 55.0% | 15.0% |

If "Yes" please describe wear characteristics:

| | |
|-----------------------|-------|
| Heavy | 30.0% |
| Hot | 30.0% |
| Perspire more readily | 25.0% |
| Noticed no change | 15.0% |

3. Was your experimental cover equipped with ventilating holes?

| <u>Yes</u> | <u>No</u> |
|------------|-----------|
| 60.0% | 40.0% |

If "Yes" was the ventilation:

| | |
|------------|-------|
| Adequate | 16.0% |
| Moderate | 42.0% |
| Inadequate | 42.0% |

3A. If "Inadequate" would more ventilating holes alleviate the difficulty?

| <u>Yes</u> | <u>No</u> |
|------------|-----------|
| 100% | 0.0% |

4. Would you consider the design of the experimental item?

| | |
|-------------------------|-------|
| Highly Satisfactory | 15.0% |
| Moderately Satisfactory | 40.0% |
| Average | 0.0% |
| Fair | 15.0% |
| Poor | 30.0% |

5. Compare the weight of the experimental test cover with your present plastic cover:

| | |
|-----------|-------|
| Too Heavy | 50.0% |
| Heavier | 45.0% |
| The Same | 5.0% |
| Lighter | 0.0% |
| Too Light | 0.0% |

6. Did the experimental item become stained, soiled or discolored?

| <u>Yes</u> | <u>No</u> |
|------------|-----------|
| 75.0% | 25.0% |

If "Yes" was it easily cleaned?

| <u>Yes</u> | <u>No</u> | <u>Don't Remember</u> |
|------------|-----------|-----------------------|
| 75.0% | 10.0% | 15.0% |

7. Indicate typical duration of wear for service cap per day:

| | |
|--------------------|-------|
| Less than one hour | 55.0% |
| 1-2 hours | 25.0% |
| 2-4 hours | 15.0% |
| 4-8 hours | 5.0% |
| Over 8 hours | 0.0% |

7A. Type of duty (when wear testing experimental item):

| | |
|-------|-------|
| Shore | 85.0% |
| Ship | 15.0% |

8. List the numerical quantity of service cap covers currently in your possession:

| | |
|-----------------------|------------------|
| Cotton | 5 each (average) |
| Plastic coated cotton | 2 each (average) |

9. List the numerical quantity of combination service cap frames currently in your possession:

| | |
|---------|--------|
| Minimum | 1 each |
| Average | 2 each |
| Maximum | 4 each |

10. List any other comments you may have or may have heard from shipmates regarding the experimental slush-molded cover that you service tested:

A. Good idea.

B. Would prefer item provided it was lighter in weight, breathable (dissipated heat), and of a uniform thickness.

C. Appearance could be improved by elimination of the many physical disfigurements, such as bubbles, blisters, appearing on top of the cover which tend to be a distraction to the user not accustomed to such process defects.

Appendix B. References

1. Chaiken, A.J., One-Size Slush-Molded Polyvinyl Chloride Cover for the Navy Male Service Combination Cap Frame (Interim Report), NCTRF Technical Report No. 125, March 1977.